## **EXHIBIT 74**

IN THE UNITED STATES DISTRICT COURT SOUTHERN DISTRICT OF NEW YORK \*\*\*\*\*\*\*\*\* CARNEGIE INSTITUTION OF WASHINGTON AND M7D CORPORATION, Plaintiffs, CASE NO: 20-CV-189 (JSR) vs. PURE GROWN DIAMONDS, INC., and IIA TECHNOLOGIES PTE. LTD. d/b/a IIA TECHNOLOGIES, Defendants. \*\*\*\*\*\*\*\*\* CARNEGIE INSTITUTION OF WASHINGTON and M7D CORPORATION, Plaintiffs, CASE NO: 20-CV-200 (JSR) vs. FENIX DIAMONDS, LLC, Defendants. The video deposition of YOGESH K. VOHRA, Ph.D., taken remotely via Zoom videoconference with the witness located in Washington, DC, on July 31, 2020, commencing at approximately 10:00 a.m. ET Reported by:

Henderson Legal Services, Inc.

L. ALAN PEACOCK, RDR, CRC, CCR

JOB NO. 48951

July 31, 2020

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2
            APPEARANCES
                                                                                                    EXAMINATION
     ON BEHALF OF THE PLAINTIFFS CARNEGIE INSTITUTION OF
                                                                                            DEPOSITION OF YOGESH K. VOHRA, PH.D., 7-31-2020
     WASHINGTON AND M7D CORPORATION:
                                                                                            By Mr. Long .....
                                                                                                                         ... Page 9
                                                                                             By Mr. Snow .....
                                                                                                                        .... Page 137
        PERKINS COIE LLP
                                                                                             By Ms. Fowler ...... Page 190
        1155 Avenue of the Americas
                                                                                             By Mr. Long ...... Page 196
        22nd Floor
        New York, New York 10036
                                                                                            By Mr. Snow .......
                                                                                                                         ... Page 213
       212-399-8057
                                                                                                     DEPOSITION EXHIBITS
                                                                                            Exhibit
       BY: SARAH E. FOWLER, ESQ
                                                                                            Number
         sfowler@perkinscoie.com
                                                                                           Exhibit 1 Subpoena to Appear for Deposition ..... Page 10
          and
JOSEPH W. RICIGLIANO, Ph.D.
                                                                                            Exhibit 2 List of Dr. Vohra's Publications ..... Page 14
                                                                                            Exhibit 3 Dissertation entitled "Synthesis and .. Page 28
          jricigliano@perkinscoie.com
                                                                                                   Characterization of Metastable Phases
                                                                                      13
     ON BEHALF OF THE DEFENDANT IIA TECHNOLOGIES PTE
                                                                                                   of Carbon" by Thomas Greene McCauley
     LIMITED AND PURE GROWN DIAMONDS, INC., IN THE 189
                                                                                     14
                                                                                            Exhibit 4 Article Entitled "Spatially Resolved .. Page 65
     MATTER:
                                                                                                   In Situ Diagnostics for
       FINNEGAN, HENDERSON, FARABOW, GARRETT
                                                                                      15
                                                                                                   Plasma-Enhanced Chemical Vapor
        & DUNNER, LLP
                                                                                                   Deposition Film Growth"
        901 New York Avenue, NW
        Washington, DC 20001
                                                                                            Exhibit 5 Thesis by Gopi Krishna Samudrala ..... Page 67
       202-408-4000
       BY: J. PRESTON LONG, ESQ.
                                                                                                   entitled "Multivariable Study on
         j.preston.long@finnegan.com
                                                                                                   Homoepitaxial Growth of Diamond on
                                                                                                   Planar and Non-Planar Substrates
     ON BEHALF OF THE DEFENDANT FENIX DIAMONDS, LLC, IN
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     THE 200 CASE:
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       LEYDIG, VOIT & MAYER, LTD.
        180 North Stetson Avenu
                                                                                            Exhibit 7 Dissertation Entitled: .......
        Suite 4900
                                                                                                   Micro-Structure and Mechanical
        Chicago, Illinois 60601
        312-616-5600
                                                                                                   Properties of Diamond Films on
       BY: DAVID M. AIRAN, ESQ.
                                                                                                   T1-6AL-4V Alloy by Shane A. Catledge
         dairan@leydig.com
                                                                                     23
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          MAX B. SNOW, ESQ.
                                                                                                   Detailed Investigation of Microwave
          msnow@leydig.com
                                                                                                   plasma Assisted Chemical Vapor
25
                                                                                                   Deposition Diamond Growth Parameters"
                                                                             3
                                                                                                                                                                   5
          APPEARANCES (Continued)
                                                                                                     EXHIBITS (Continued)
                                                                                            Exhibit 9 Thesis Entitled "Multiple Twinning .... Page 87
     ON BEHALF OF THE WITNESS:
                                                                                                   and Nitrogen Defect Center in
         UNIVERSITY OF ALABAMA OFFICE OF COUNSEL
                                                                                                   Chemical Vapor Deposited
         500 University Boulevard East
                                                                                                   Homoepitaxial Diamond by Chih-Shiue
         Tuscaloosa, Alabama 35401
                                                                                            Exhibit 10 Article Entitled "Very High Growth ... Page 119
         205-348-5861
                                                                                                   Rate Chemical Vapor Deposition of
                                                                                                   Single-Crystal Diamond"
                                                                                            Exhibit 11 078 Provisional Patent Application ... Page 127
         BY: DAVID MELLON, Ph.D.
                                                                                            Exhibit 12 US Patent 6,858,078 B2 ...... Page 132
           dmellon@uasystem.edu
                                                                                            Exhibit 13 Patent US 2009/0297429 .......
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        L. ALAN PEACOCK, FAPR, CRC, CCR, RDR
                                                                                                   Twinning and Nitrogen Defect Center
         Realtime Systems Administrator
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                                                                                                   Homoepitaxial Diamond"
                                                                                     14
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                                                                                            Exhibit 104 Article Entitled "Growth of Diamond .. Page 184
12
         NAN MARSHALL, Henderson Legal Services
                                                                                      15
                                                                                                   Anvils for High-Pressure Research by
13
      VIDEOGRAPHER:
                                                                                                   Chemical Vapor Deposition
14
         CARRIE HOWARD
                                                                                            Exhibit 105 Article Entitled "Multiple .......
                                                                                                   Substrate Microwave Plasma-Assisted
                                                                                                   Chemical Vapor Deposition Single
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                                                                                     19
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                                                                                                   Homoepitaxial Growth of CVD Single
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                                                                                                   Crystal Diamond Substrates"
                                                                                            Exhibit 108 Article Entitled "Synthetic Diamond .. Page 173
                                                                                                   Crystal Strength Enhancement Through
                                                                                                   Annealing at 50 Kbar and 1500 C"
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Henderson Legal Services, Inc.

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1	EXHIBITS (Continued)		1	THE VIDEOGRAPHER: All right. And will	09:09:12
2	Exhibit 109 Declaration and Power of Attorney Page 173		2	the court reporter now please swear in the	09:09:12
	for Patent Application"		3	witness.	09:09:12
3			4	MR. AIRAN: There are more appearances.	09:09:12
	Exhibit 110 Combined Declaration for Patent Page 173		5	This is David Airan on from Leydig, Voit &	09:09:12
4	Application and Power of Attorney"		6	Mayer on behalf of Fenix Diamonds, LLC, in	09:09:14
5			7	the 200 case. And with me is Max Snow, also of	09:09:17
6			8	Leydig Voit & Mayer, also representing Fenix	09:09:21
7			9	Diamonds, LLC.	09:09:25
8			10		09:09:27
9			11	MR. MELLON: Although you can't see me,	09:09:27
10			12	this is David Mellon, M-E-L-L-O-N, counsel for	09:09:32
11			13	Dr. Vohra.	09:09:40
12				THE VIDEOGRAPHER: Okay. Now, will the	
13			14	court reporter please swear in the witness.	09:09:41
14			15	THE COURT REPORTER: My name is Alan	09:09:43
16			16	Peacock with Henderson Legal Services. I am an	09:09:43
17			17	Alabama Certified Court Reporter. My license	09:09:43
18			18	number is AL013, and my license is available	09:09:43
19			19	for inspection.	09:09:43
20			20	At this time, do all parties agree to	09:09:43
21			21	waive any objection now or in the future to the	09:09:43
22			22	reporter swearing in the witness remotely?	09:09:43
23			23	Please so indicate.	09:09:43
24			24	MR. LONG: No objection here.	09:09:43
25			25	MR. AIRAN: No objection on behalf of	09:09:43
1	THE VIDEOGRAPHER: Here begins Volume I,	7	1	Fenix.	09:09:43
2	Disk 1, in the video deposition of Yogesh Vohra	09:07:49	2	THE COURT REPORTER: Thank you.	09:09:43
3	taken in the matter of, Case 1, Carnegie	09:07:51	3	I would ask the witness to please raise	09:09:43
4	Institution, et al., versus Pure Grown	09:07:58	4	your right hand and face the camera.	09:09:43
5	Diamonds, et al. We also have Case 2, which is	09:08:02	5	YOGESH K. VOHRA, PH.D.,	09:09:43
6	Carnegie Institution, et al., vs Fenix	09:08:07	6	the witness, having been first duly sworn	09:09:43
7	Diamonds, et al., in the United States District	09:08:07	7	to speak the truth, the whole truth, and nothing but	09:09:43
8	Court, Southern District of New York.	09:08:08	8	the truth, testified as follows:	09:09:43
9	Today's date is July 31. The time is	09:08:10	9	EXAMINATION	09:09:43
10	9:08 a.m. This deposition is being held	09:08:13	10	BY MR. LONG:	09:10:32
11	remotely by Live Litigation. We're physically	09:08:17	11	Q. So let me first start, Dr. Vohra, by	09:10:33
12	recording in Lexington, Kentucky.	09:08:21	12	saying thank you for being here today. There are	09:10:36
13	The court reporter today is Alan Peacock,	09:08:23	13	probably any number of things you would rather be	09:10:39
14	and the videographer today is myself, Carrie	09:08:25	14	doing today; so for what it's worth, we appreciate	09:10:41
15	Howard. Both are presenting on behalf of	09:08:29	15	your time.	09:10:43
16	Henderson Legal Services.	09:08:31	16	Is this your first deposition?	09:10:44
17	Will counsel please introduce themselves	09:08:33	17	A. That's correct.	09:10:47
18	and state whom they represent.	09:08:35	18	Q. Okay. So I just want to run through a few	09:10:49
19	MR. LONG: This is J. Preston Long for the	09:08:38	19	guidelines to make sure everything goes smoothly. I	09:10:52
20	_	09:08:41	20		09:10:55
21	defendants IIA Technologies PTE Limited and	09:08:46	21	think that the court reporter has already mentioned	09:10:57
22	Pure Grown Diamonds, Inc., in the 189 matter.	09:08:54	22	it's best if we don't talk over one another so that	09:11:00
	MS. FOWLER: This is Sarah Fowler of			the court reporter can take down our conversation	
23	Perkins Couie, on behalf of the plaintiffs	09:08:55	23	and there's no cross talk. Is that okay?	09:11:02
24	Carnegie Institution of Washington and M7D	09:08:57	24	A. That's fine.     Q. From time to time, I probably will ask a	09:11:07
25	Corporation. And with me is Joseph Ricigliano.	09:09:01	25		

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		58			60
1	if the growth rates the CVD growth rates that he	10:30:27	1	area new growth.	10:33:56
2	achieved were 50 to 400 microns per hour using the	10:30:34	2	Q. Okay. But on what the anvils that he	10:33:57
3	substrates he was using?	10:30:38	3	used for substrates, he grew at substrate	10:34:02
4	A. Yeah. I gave you you know it is done	10:30:39	4	temperatures of 900 and 1400-degree C; correct?	10:34:06
5	for a short period of time. And what we found was	10:30:41	5	A. Yes.	10:34:13
6	the gem would grow very fast, but the quality is not	10:30:46	6	Q. And his growths satisfied the condition of	10:34:14
7	that great. So it's really it's not just a	10:30:49	7	alpha at greater than or equal to 2.5?	10:34:16
8	question of the growth rate. It's the question of	10:30:54	8	A. Yeah. But as he mentioned, it was really	10:34:22
9	can one maintain the growth rate and grow as a	10:30:58	9	empirical. I don't think there's any quantitative	10:34:25
10	crystal.	10:31:02	10	measurements	10:34:29
11	Q. Were his growths not single crystal?	10:31:04	11	Q. I'm sorry. So you're suggesting that	10:34:32
12	A. No. These experiments all have diamond	10:31:07	12	he my understanding of the sentence is that the	10:34:34
13	twins and imperfections.	10:31:17	13	empirical condition of alpha greater than 2.5 is a	10:34:40
14	Q. These experiments had twins?	10:31:18	14	prediction that certain alpha values will give you	10:34:45
15	A. Yes.	10:31:19	15	twin-free growth. But my understanding is that the	10:34:49
16	Q. And so if you have twins or imperfections,	10:31:20	16	value of alpha is actually a quantitative number.	10:34:51
17	it's not single crystal diamond?	10:31:21	17	Is that not correct?	10:34:55
18	A. That is correct. Then it's really not a	10:31:26	18	A. Yeah. But I don't think anywhere in this	10:34:58
19	true homoepitaxial. You have multiple orientation	10:31:29	19	series we measured the value of 1000. There are	10:34:59
20	of diamond growth on the substrate.	10:31:35	20	empirical relations where you would grow 100. And	10:35:10
21	Q. What about diamond like carbon or	10:31:36	21	so he just is referring to the fact with verified	10:35:18
22	polycrystalline diamond? Is that single crystal?	10:31:38	22	data of 2.5, in principle, you can grow a growth	10:35:23
23	A. No. DLC is generally amorphous. And	10:31:43	23	rate.	10:35:28
24	polycrystalline diamond, that's a different growth	10:31:48	24	Q. And he says "His deposition resulted in	10:35:29
25	regime.	10:31:57	25	values of alpha that satisfied alpha greater than or	10:35:31
1	Q. By "amorphous," you mean it has no crystal	10:31:58	1	equal to 2.5."	10:35:36
2	structure?	10:32:01	2	A. Yeah, but I don't think we had the	10:35:38
3	A. Yes. They are basically not crystalline.	10:32:04	3	quantitative you know, to get a quantitative	10:35:43
4	Q. I'm going to flip to page 164 of Vohra	10:32:14	4	value of alpha, you really have to match the growth	10:35:46
5	Exhibit 3. And again, this starts at the very end	10:32:19	5	rate along (100) and along (111). There's nowhere	10:35:48
6	of the page, so I have to scroll. The sentence	10:32:36	6	in this thesis really we have measured this value.	10:35:53
	starts at the end of the page. It says "the	10:32:38	7	<ul> <li>Q. So there's nowhere in this thesis that</li> </ul>	10:35:56
7					
8	combination" and it continues on to page 165.	10:32:41	8	measures that? That's your understanding?	10:35:59
	"The combination of nitrogen addition,	10:32:46	9	A. Yes.	10:36:00
8 9 10	"The combination of nitrogen addition, methane concentration of 2 percent and T substrate	10:32:46 10:32:50	9	A. Yes. Q. Okay. I'm almost done with this one, and	10:36:00 10:36:04
8 9 10 11	"The combination of nitrogen addition, methane concentration of 2 percent and T substrate approximately 900 to 1400C during our depositions	10:32:46 10:32:50 10:32:53	9 10 11	A. Yes.     Q. Okay. I'm almost done with this one, and then we'll take a break. I know we have been going	10:36:00 10:36:04 10:36:09
8 9 10 11	"The combination of nitrogen addition, methane concentration of 2 percent and T substrate approximately 900 to 1400C during our depositions resulted in values of alpha that satisfied the	10:32:46 10:32:50 10:32:53 10:32:57	9 10 11 12	A. Yes.  Q. Okay. I'm almost done with this one, and then we'll take a break. I know we have been going for about an hour. I will try to give you a break	10:36:04 10:36:04 10:36:09 10:36:12
8 9 10 11 12	"The combination of nitrogen addition, methane concentration of 2 percent and T substrate approximately 900 to 1400C during our depositions resulted in values of alpha that satisfied the empirical condition of alpha greater than or equal	10:32:46 10:32:50 10:32:53 10:32:57	9 10 11 12 13	A. Yes. Q. Okay. I'm almost done with this one, and then we'll take a break. I know we have been going for about an hour. I will try to give you a break every hour or so, but if you need breaks sooner than	10:36:00 10:36:04 10:36:09 10:36:12
8 9 10 11 12 13	"The combination of nitrogen addition, methane concentration of 2 percent and T substrate approximately 900 to 1400C during our depositions resulted in values of alpha that satisfied the empirical condition of alpha greater than or equal to 2.5 for twin-free homoepitaxial growth."	10:32:46 10:32:50 10:32:53 10:32:57 10:32:59 10:33:03	9 10 11 12 13	A. Yes. Q. Okay. I'm almost done with this one, and then we'll take a break. I know we have been going for about an hour. I will try to give you a break every hour or so, but if you need breaks sooner than that	10:36:00 10:36:04 10:36:09 10:36:12 10:36:15
8 9 10 11 12 13 14	"The combination of nitrogen addition, methane concentration of 2 percent and T substrate approximately 900 to 1400C during our depositions resulted in values of alpha that satisfied the empirical condition of alpha greater than or equal to 2.5 for twin-free homoepitaxial growth."  Do you see that sentence?	10:32:46 10:32:50 10:32:53 10:32:57 10:32:59 10:33:03 10:33:12	9 10 11 12 13 14	A. Yes. Q. Okay. I'm almost done with this one, and then we'll take a break. I know we have been going for about an hour. I will try to give you a break every hour or so, but if you need breaks sooner than that A. That's fine.	10:36:00 10:36:04 10:36:09 10:36:12 10:36:15 10:36:18
8 9 10 11 12 13 14 15	"The combination of nitrogen addition, methane concentration of 2 percent and T substrate approximately 900 to 1400C during our depositions resulted in values of alpha that satisfied the empirical condition of alpha greater than or equal to 2.5 for twin-free homoepitaxial growth."  Do you see that sentence?  A. Yes.	10:32:46 10:32:50 10:32:53 10:32:57 10:32:59 10:33:03 10:33:12 10:33:13	9 10 11 12 13 14 15	A. Yes. Q. Okay. I'm almost done with this one, and then we'll take a break. I know we have been going for about an hour. I will try to give you a break every hour or so, but if you need breaks sooner than that A. That's fine. Q. Okay. I'll direct your attention now	10:36:00 10:36:04 10:36:09 10:36:12 10:36:15 10:36:18 10:36:22
8 9 10 11 12 13 14 15 16	"The combination of nitrogen addition, methane concentration of 2 percent and T substrate approximately 900 to 1400C during our depositions resulted in values of alpha that satisfied the empirical condition of alpha greater than or equal to 2.5 for twin-free homoepitaxial growth."  Do you see that sentence?  A. Yes.  Q. Could you explain what it means?	10:32:46 10:32:50 10:32:53 10:32:57 10:32:59 10:33:03 10:33:12 10:33:13	9 10 11 12 13 14 15 16	A. Yes. Q. Okay. I'm almost done with this one, and then we'll take a break. I know we have been going for about an hour. I will try to give you a break every hour or so, but if you need breaks sooner than that  A. That's fine. Q. Okay. I'll direct your attention now to this is page 169 of Vohra Exhibit 3. Starting	10:36:00 10:36:04 10:36:09 10:36:12 10:36:15 10:36:19 10:36:22
8 9 10 11 12 13 14 15 16 17 18	"The combination of nitrogen addition, methane concentration of 2 percent and T substrate approximately 900 to 1400C during our depositions resulted in values of alpha that satisfied the empirical condition of alpha greater than or equal to 2.5 for twin-free homoepitaxial growth."  Do you see that sentence?  A. Yes.  Q. Could you explain what it means?  A. What Dr. McCauley is saying here is the	10:32:46 10:32:50 10:32:53 10:32:57 10:32:59 10:33:03 10:33:12 10:33:13 10:33:14 10:33:17	9 10 11 12 13 14 15 16 17	A. Yes. Q. Okay. I'm almost done with this one, and then we'll take a break. I know we have been going for about an hour. I will try to give you a break every hour or so, but if you need breaks sooner than that A. That's fine. Q. Okay. I'll direct your attention now to this is page 169 of Vohra Exhibit 3. Starting here with "the observed rapid growth of diamond	10:36:00 10:36:04 10:36:09 10:36:12 10:36:15 10:36:19 10:36:22 10:36:24 10:36:33
8 9 110 111 112 13 14 15 16 17 18 19	"The combination of nitrogen addition, methane concentration of 2 percent and T substrate approximately 900 to 1400C during our depositions resulted in values of alpha that satisfied the empirical condition of alpha greater than or equal to 2.5 for twin-free homoepitaxial growth."  Do you see that sentence?  A. Yes.  Q. Could you explain what it means?  A. What Dr. McCauley is saying here is the potential in which the result could possibly result	10:32:46 10:32:50 10:32:53 10:32:57 10:32:59 10:33:03 10:33:12 10:33:13 10:33:17 10:33:22	9 10 11 12 13 14 15 16 17 18	A. Yes. Q. Okay. I'm almost done with this one, and then we'll take a break. I know we have been going for about an hour. I will try to give you a break every hour or so, but if you need breaks sooner than that  A. That's fine. Q. Okay. I'll direct your attention now to this is page 169 of Vohra Exhibit 3. Starting here with "the observed rapid growth of diamond films," do you mind just I'll ask you to read and	10:36:00 10:36:04 10:36:09 10:36:12 10:36:18 10:36:19 10:36:22 10:36:33 10:36:39
8 9 9 110 111 112 113 114 115 116 117 118 119 119 120	"The combination of nitrogen addition, methane concentration of 2 percent and T substrate approximately 900 to 1400C during our depositions resulted in values of alpha that satisfied the empirical condition of alpha greater than or equal to 2.5 for twin-free homoepitaxial growth."  Do you see that sentence?  A. Yes.  Q. Could you explain what it means?  A. What Dr. McCauley is saying here is the potential in which the result could possibly result in twin-free growth again, we're in a very	10:32:46 10:32:50 10:32:53 10:32:57 10:32:59 10:33:03 10:33:12 10:33:13 10:33:14 10:33:17 10:33:22 10:33:30	9 10 11 12 13 14 15 16 17 18 19 20	A. Yes. Q. Okay. I'm almost done with this one, and then we'll take a break. I know we have been going for about an hour. I will try to give you a break every hour or so, but if you need breaks sooner than that  A. That's fine. Q. Okay. I'll direct your attention now to this is page 169 of Vohra Exhibit 3. Starting here with "the observed rapid growth of diamond films," do you mind just I'll ask you to read and just let me know, and I will scroll for you. But I	10:36:00 10:36:04 10:36:12 10:36:18 10:36:19 10:36:22 10:36:33 10:36:39
8 9 10 11 12 13 14 15 16 16 17 18 19 20 21	"The combination of nitrogen addition, methane concentration of 2 percent and T substrate approximately 900 to 1400C during our depositions resulted in values of alpha that satisfied the empirical condition of alpha greater than or equal to 2.5 for twin-free homoepitaxial growth."  Do you see that sentence?  A. Yes.  Q. Could you explain what it means?  A. What Dr. McCauley is saying here is the potential in which the result could possibly result in twin-free growth again, we're in a very limited area remember, all of his thesis work had	10:32:46 10:32:50 10:32:53 10:32:57 10:32:59 10:33:03 10:33:12 10:33:14 10:33:17 10:33:22 10:33:30 10:33:35	9 10 11 12 13 14 15 16 17 18 19 20 21	A. Yes. Q. Okay. I'm almost done with this one, and then we'll take a break. I know we have been going for about an hour. I will try to give you a break every hour or so, but if you need breaks sooner than that  A. That's fine. Q. Okay. I'll direct your attention now to this is page 169 of Vohra Exhibit 3. Starting here with "the observed rapid growth of diamond films," do you mind just I'll ask you to read and just let me know, and I will scroll for you. But I will ask that you read that section through the next	10:36:00 10:36:04 10:36:09 10:36:12 10:36:15 10:36:19 10:36:22 10:36:33 10:36:39 10:36:46
8 9 110 111 112 113 114 115 116 117 118 119 220 221 222	"The combination of nitrogen addition, methane concentration of 2 percent and T substrate approximately 900 to 1400C during our depositions resulted in values of alpha that satisfied the empirical condition of alpha greater than or equal to 2.5 for twin-free homoepitaxial growth."  Do you see that sentence?  A. Yes.  Q. Could you explain what it means?  A. What Dr. McCauley is saying here is the potential in which the result could possibly result in twin-free growth again, we're in a very limited area remember, all of his thesis work had been done on a diamond anvil with a tip of about	10:32:46 10:32:50 10:32:53 10:32:57 10:32:59 10:33:03 10:33:12 10:33:14 10:33:17 10:33:22 10:33:30 10:33:35 10:33:40	9 10 11 12 13 14 15 16 17 18 19 20 21	A. Yes.  Q. Okay. I'm almost done with this one, and then we'll take a break. I know we have been going for about an hour. I will try to give you a break every hour or so, but if you need breaks sooner than that  A. That's fine.  Q. Okay. I'll direct your attention now to this is page 169 of Vohra Exhibit 3. Starting here with "the observed rapid growth of diamond films," do you mind just I'll ask you to read and just let me know, and I will scroll for you. But I will ask that you read that section through the next page and then this figure here. I want to ask you a	10:36:00 10:36:04 10:36:12 10:36:15 10:36:18 10:36:22 10:36:24 10:36:33 10:36:46 10:36:46
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32 (Pages 122 to 125)

		122			124
1	A. I don't know. I don't recall the details.	12:48:23	1	Q. Okay. It mentions here that the	12:51:29
2	Q. Did it have physical contact to the side	12:48:31	2	substrates were 3 and a half by 3 and a half	12:51:32
3	of the diamond seed?	12:48:34	3	by 1.6 cubic millimeters; so this would have been a	12:51:34
4	A. I don't recall that. I don't actually	12:48:40	4	3 and a half by 3 and a half square that's	12:51:39
5	have access right now to those designs which we	12:48:43	5	1.6-millimeters thick; right?	12:51:43
6	dictated on the 6-kilowatt system to really make a	12:48:48	6	A. That's right.	12:51:46
7	definitive statement.	12:48:52	7	Q. And this was the seed, the (100) HPHT?	12:51:46
8	Q. It says that the temperature was measured	12:48:54	8	A. Yes.	12:51:51
9	by two-color infrared pyrometer made by Mikron	12:48:57	9	Q. And remember that this was a commercial	12:51:54
10	Instruments with a 2-millimeter diameter minimum	12:49:05	10	yellow diamond plate. It's not a white diamond.	12:51:57
11	target size at an angle of 65 degrees C.	12:49:09	11	A. Right.	12:52:01
12	Do you see that?	12:49:12	12	Q. And so this Figure 1 here on page 2 of	12:52:02
13	A. Yes.	12:49:13	13	this Exhibit shows a picture of the growth?	12:52:16
14	Q. And again, what is this the 2-millimeter	12:49:14	14	A. Yes.	12:52:21
15	in diameter referring to?	12:49:17	15	Q. The left is the seed with no growth;	12:52:21
16	A. That's the aperture on the diamond to	12:49:19	16	correct?	12:52:23
17	measure the temperature.	12:49:23	17	A. Yes.	12:52:23
18	Q. And when you aim it at a 65-degree angle,	12:49:24	18	Q. And the right is the growth?	12:52:24
19	is it still a circle?	12:49:28	19	A. Yes.	12:52:26
20	A. I mean, when you look through it, you	12:49:42	20	Q. And that was it looks here .7 microns	12:52:27
21	know, you see a circle. Obviously, you are looking	12:49:44	21	thick? Excuse me .7-millimeter thick/700 microns?	12:52:33
22	at an angle, and that would be a certain projection	12:49:46	22	A. Yes.	12:52:42
23	of it on the diamond.	12:49:50	23	Q. That was a 12-hour growth run; correct?	12:52:42
24	Q. It's kind of like when you shine a	12:49:51	24	A. Yes.	12:52:44
25	flashlight at an angle? It gets stretched out?	12:49:54	25	Q. And what happened when you tried to grow	12:52:45
			-		
		123			125
1	A. It's the same principle, yes.	12:49:57	1	it for much longer?	12:52:48
2					
-	<ul> <li>Q. So the actual spot that you would be</li> </ul>	12:49:58	2	A. Yeah. I think as this paper described, I	12:53:00
3	Q. So the actual spot that you would be measuring here would be 2 point wide and then	12:49:58	2	<del>-</del>	
	· · · · ·			A. Yeah. I think as this paper described, I	12:53:00
3	measuring here would be 2 point wide and then	12:50:01	3	A. Yeah. I think as this paper described, I think yeah, a larger crystal was obtained, up	12:53:00 12:53:06
3	measuring here would be 2 point wide and then stretched out in the other direction according to	12:50:01 12:50:05	3 4	A. Yeah. I think as this paper described, I think yeah, a larger crystal was obtained, up to 5 carat.	12:53:00 12:53:06 12:53:14
3 4 5	measuring here would be 2 point wide and then stretched out in the other direction according to the 65-degree angle; is that right?	12:50:01 12:50:05 12:50:07	3 4 5	A. Yeah. I think as this paper described, I think yeah, a larger crystal was obtained, up to 5 carat.  Q. But it was brown and it cracked?	12:53:00 12:53:06 12:53:14 12:53:18
3 4 5	measuring here would be 2 point wide and then stretched out in the other direction according to the 65-degree angle; is that right?  A. Yes. To make a definitive statement, one	12:50:01 12:50:05 12:50:07 12:50:14	3 4 5	A. Yeah. I think as this paper described, I think yeah, a larger crystal was obtained, up to 5 carat.  Q. But it was brown and it cracked?  A. Yes. I think the same problem with	12:53:00 12:53:06 12:53:14 12:53:18 12:53:21
3 4 5 6 7	measuring here would be 2 point wide and then stretched out in the other direction according to the 65-degree angle; is that right?  A. Yes. To make a definitive statement, one really would have to look at the optics. Because	12:50:01 12:50:05 12:50:07 12:50:14 12:50:16	3 4 5 6	A. Yeah. I think as this paper described, I think yeah, a larger crystal was obtained, up to 5 carat.  Q. But it was brown and it cracked?  A. Yes. I think the same problem with several regrowth experiments.	12:53:00 12:53:06 12:53:14 12:53:18 12:53:21 12:53:25
3 4 5 6 7	measuring here would be 2 point wide and then stretched out in the other direction according to the 65-degree angle; is that right?  A. Yes. To make a definitive statement, one really would have to look at the optics. Because you also have to have, you know, the depth of focus	12:50:01 12:50:05 12:50:07 12:50:14 12:50:16 12:50:19	3 4 5 6 7	A. Yeah. I think as this paper described, I think yeah, a larger crystal was obtained, up to 5 carat.  Q. But it was brown and it cracked?  A. Yes. I think the same problem with several regrowth experiments.  Q. So those were done by regrowing several	12:53:00 12:53:06 12:53:14 12:53:18 12:53:21 12:53:25
3 4 5 6 7	measuring here would be 2 point wide and then stretched out in the other direction according to the 65-degree angle; is that right?  A. Yes. To make a definitive statement, one really would have to look at the optics. Because you also have to have, you know, the depth of focus of the parameter, how deep it collects light in. So	12:50:01 12:50:05 12:50:07 12:50:14 12:50:16 12:50:19 12:50:24	3 4 5 6 7 8	A. Yeah. I think as this paper described, I think yeah, a larger crystal was obtained, up to 5 carat.  Q. But it was brown and it cracked?  A. Yes. I think the same problem with several regrowth experiments.  Q. So those were done by regrowing several times?	12:53:00 12:53:06 12:53:14 12:53:18 12:53:21 12:53:25 12:53:27
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		150			152
1	Q. So you talked earlier about how a	01:49:07	1	spot. Will this pyrometer be able to tell you what	01:52:49
2	two-color averages the temperatures within that	01:49:08	2	the hottest temperature in that spot is?	01:52:54
3	little spot. Is that right?	01:49:13	3	A. No. It will only give you an average	01:52:58
4	A. Yes.	01:49:16	4	temperature. Because the way it works is it really	01:53:00
5	Q. Or roughly average. So my question is, if	01:49:21	5	is taking a ratio of the infrared light coming out	01:53:03
6	you're measuring, let's say, the center of a diamond	01:49:27	6	and calculating. So you have really no way to find	01:53:07
7	with this pyrometer, will the pyrometer be able to	01:49:31	7	the maximal or minimal temperature.	01:53:13
8	tell you what the coldest point on the diamond is?	01:49:38	8	Q. So let's say you poke this at the edge,	01:53:18
9	A. No.	01:49:48	9	and then you put this at the center, you might be	01:53:22
10	Q. Because it's going to take an average; is	01:49:49	10	getting a temperature gradient reading that is much	01:53:24
11	that right?	01:49:51	11	too low because of this averaging; is that correct?	01:53:27
12	A. Yes.	01:49:54	12	A. Yeah. It's definitely not accurate.	01:53:37
13	Q. Okay. Will it be able to tell you what	01:49:57	13	Q. Okay. All right. All right. So let me	01:53:41
14	the hottest point on the grill surface is?	01:49:59	14	move on to Exhibit 11, which is the 078 patent.	01:53:49
15	A. Can you repeat the question? Are you	01:50:09	15	I'm sorry. Maybe it's Exhibit 12. Yeah,	01:54:06
16		01:50:12	16		01:54:13
17	doing measuring only at the center?	01:50:14	17	it's Exhibit 12. I apologize.	01:54:22
18	Q. No. Now let's say you move it to the	01:50:17	18	So if you took this patent, what do you	01:54:25
19	edge. Okay? Will it be able to tell you what the	01:50:21	19	think the kind of the main thrust of the	01:54:29
20	hottest points on the edge is?	01:50:24	20	invention here was?	01:54:34
21	A. Sure. If you can do the scanning across	01:50:24	21	A. I think it was multipronged because of the	01:54:37
	the edges and you can definitely measure the	01:50:34	22	gross chemistry substrate design of the holder.	01:54:46
22	gradient within that revolution of 2 millimeters,			Q. Okay.	
23	you can find the hot spot. With hot spots, you can	01:50:43	23	A. Also some of the innovation was in terms	01:54:48
24	also probably target visually usually they come	01:50:47	24	of translation of the diamond stage.	01:54:50
25	back of the graphite formation on the edges.	01:50:50	25	Q. Okay.	01:54:53
			+		
		151			153
1	O So when you get kind of I will call	151	1	A So it's roally multiple levels It's hard	153
1 2	Q. So when you get kind of I will call	01:50:57		A. So it's really multiple levels. It's hard	01:54:53
2	it non-monocrystalline growth at the edges,	01:50:57 01:51:00	1 2 3	to say this one thing.	
2	it non-monocrystalline growth at the edges, that's a sign of a hot spot; is that correct?	01:50:57 01:51:00 01:51:03	2	to say this one thing.  Q. Okay. Absolutely. I want to go to I	01:54:53 01:54:58 01:55:00
2 3 4	it non-monocrystalline growth at the edges, that's a sign of a hot spot; is that correct?  A. I think this would be a very difficult	01:50:57 01:51:00 01:51:03 01:51:18	2 3 4	to say this one thing.  Q. Okay. Absolutely. I want to go to I want to jump to Claim 1 which is on page well,	01:54:53 01:54:58 01:55:00 01:55:15
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2 3 4 5	it non-monocrystalline growth at the edges, that's a sign of a hot spot; is that correct?  A. I think this would be a very difficult determination to make because you may be getting non-diamond growth because it is not a (100)	01:50:57 01:51:00 01:51:03 01:51:18 01:51:23 01:51:32	2 3 4 5	to say this one thing.  Q. Okay. Absolutely. I want to go to I want to jump to Claim 1 which is on page well, it's actually on page 18, the part I'm looking at.  Let me I will zoom in for you.	01:54:53 01:54:58 01:55:00 01:55:15 01:55:21
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2 3 4 5 6 7 8 9	it non-monocrystalline growth at the edges, that's a sign of a hot spot; is that correct?  A. I think this would be a very difficult determination to make because you may be getting non-diamond growth because it is not a (100) surface, so it may not necessarily be related to temperature. It could be that you have (111) surface exposed.  Q. All right. What if the	01:50:57 01:51:00 01:51:03 01:51:18 01:51:23 01:51:32 01:51:35 01:51:37 01:51:41 01:51:47	2 3 4 5 6 7 8 9	to say this one thing.  Q. Okay. Absolutely. I want to go to I want to jump to Claim 1 which is on page well, it's actually on page 18, the part I'm looking at.  Let me I will zoom in for you.  Do you see that, those highlights?  A. Yes.  Q. Okay. So do you think this is something that all diamond I'm sorry that all MPCVD	01:54:53 01:55:00 01:55:15 01:55:21 01:55:25 01:55:38 01:55:43
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